

学校编码: 10384

密级_____

学 号: 22320091154184

厦 门 大 学

硕 士 学 位 论 文

喀麦隆河口区域渔业可持续发展管理研究

Sustainable Development Challenges in Cameroon Estuarine

complex and Opportunities for Integrated Management:

Focus on the fisheries sector

Anthony Banyouko Ndah

指导教师姓名: 薛雄志 教授

专 业 名 称: 海 洋 事 务

论文提交日期: 2011 年 05 月

论文答辩时间: 2011 年 06 月

2011 年 05 月

厦门大学学位论文原创性声明

本人呈交的学位论文是本人在导师指导下,独立完成的研究成果。本人在论文写作中参考其他个人或集体已经发表的研究成果,均在文中以适当方式明确标明,并符合法律规范和《厦门大学研究生学术活动规范(试行)》。

另外,该学位论文为()课题(组)的研究成果,获得()课题(组)经费或实验室的资助,在()实验室完成。(请在以上括号内填写课题或课题组负责人或实验室名称,未有此项声明内容的,可以不作特别声明。)

声明人(签名):

年 月 日

厦门大学学位论文著作权使用声明

本人同意厦门大学根据《中华人民共和国学位条例暂行实施办法》等规定保留和使用此学位论文，并向主管部门或其指定机构送交学位论文（包括纸质版和电子版），允许学位论文进入厦门大学图书馆及其数据库被查阅、借阅。本人同意厦门大学将学位论文加入全国博士、硕士学位论文共建单位数据库进行检索，将学位论文的标题和摘要汇编出版，采用影印、缩印或者其它方式合理复制学位论文。

本学位论文属于：

（ ） 1. 经厦门大学保密委员会审查核定的保密学位论文，于
年 月 日解密，解密后适用上述授权。

（ ） 2. 不保密，适用上述授权。

（请在以上相应括号内打“√”或填上相应内容。保密学位论文应是已经厦门大学保密委员会审定过的学位论文，未经厦门大学保密委员会审定的学位论文均为公开学位论文。此声明栏不填写的，默认为公开学位论文，均适用上述授权。）

声明人（签名）：

年 月 日

CONTENTS

List of Abbreviations.....	IV
List of Figures.....	V
List of Graphs	VI
List of Plates	VII
List of Tables.....	VIII
Abstract.....	1
1.Introduction, Literature Review and Background information	6
1.1. Introduction	6
1.2. Literature Review: Estuarine environmental and management issues.....	8
1.2.1. Summary	9
1.2.2. A global study of Estuaries: Environmental and Socio-economic Issues	10
1.2.3. Biological Life and productivity of Estuaries.....	11
1.2.4. Socio-economic issues	13
1.2.5. Estuarine environmental challenges	13
1.2.6. Climate Change impacts.....	14
1.2.7. Eutrophication and algal blooms.....	16
1.2.8. Invasive species.....	17
1.2.9. A review of the state of the Cameroon Estuary.....	20
1.2.10. Industrial pollution.....	20
1.2.11. Nutrient loading and Eutrophication	22
1.2.12. Planning and management of the urban landscape within the Cameroon estuary	23
1.2.13. Flood Disaster risks.....	24
1.2.14. Ecological and resource degradation.....	25
1.2.15. How is estuarine ecosystem health assessed?	27
1.2.16. Estuarine ecosystem protection and management options	28
1.2.17. ICM and estuarine sustainability.....	31
1.3. The Cameroon Estuary: Physiographic, Socio-Economic and Political Background	36
1.3.1. Physical Background.....	36
1.3.2. Hydro-geologic and characteristics	37
1.3.3. Climatic factors.....	41
1.3.4. Salinity characteristics.....	43
1.3.5. Coastal/estuarine ecology - Mangroves.....	43
1.3.6. Socio-economic background: Introducing the city of Douala	45
1.3.7. Demography and socio-economics of Douala.....	46
1.3.8. Economic background	48
1.3.9. Politico-administrative issues	51
2. Research Hypothesis, Objectives and Methodology	54
2.1. Research hypotheses.....	54
2.2. Research objectives and aims	54
2.2.1. Specific objectives	54
2.2.2. General objectives.....	55

2.3. Research Methodology	56
2.3.1. Data collection	56
2.3.2. Data analysis	60
2.3.2.1. Use of Models	60
2.4. Time schedule of the study	61
2.5. Ethical considerations	61
3. Cameroon estuarine ecosystem wealth, uses and sustainable development challenges: analyzing the problem.....	62
3.1. Goods and services in the Cameroon Estuary.....	62
3.1.1. Provisioning services	62
3.1.2. Cultural services	67
3.1.3. Regulating and supporting services	69
3.2. Socio-economic Pressures and impacts on the Cameroon estuarine sustainability	72
3.2.1. The Agricultural sector	74
3.2.2. Industrial uses	80
3.2.3. Residential uses and urban development sector	82
3.2.4. The mangrove wood sector.....	90
3.2.5. The mining Sector	93
3.2.6. Boat construction	95
3.2.7. Port and Maritime transportation Sector	97
3.3. The Sustainable Development concept: Evolution, Rationale and challenges.....	101
3.3.1. Critical assessment of some existing S.D Models: Development of the Stages of S.D Model	102
3.3.2. Model description	104
3.3.3. Rationale of the stages of Sustainable Development Model and its applicability	107
3.3.4. Discussion and outlook	107
4. Sustainable livelihood challenges within the fisheries sector and fishing communities of the Cameroon Estuary	110
4.1. Summary	110
4.2. The fisheries sector in the Cameroon and its management: A review	112
4.2.1. Industrial Fisheries	114
4.2.2. Artisanal fisheries.....	115
4.3. Sustainable livelihood (S.L) challenges within the artisanal fisheries sector of the Cameroon estuary:the case of Youpwe, Bonasama and Manoka localities.....	122
4.3.1. Analysis of S.L challenges based on Comparability Poverty Measure (CPM)	123
4.3.1.1. Employment situation in the artisanal fishing sector.....	132
4.3.1.2. Access to social amenities.....	135
4.3.1.3. Costs of living.....	138
4.3.1.4. Living and working conditions.....	140
4.3.1.5. Hygienic and sanitation conditions.....	141
4.4. Analysis of estuarine environmental health and community livelihoods status using the Driver-Pressure-State-Response (DPSR) Model	134
4.4.1. Model description	137
4.5. Assessment of ecosystem Services and human wellbeing in the Cameroon estuary	138

4.5.1. Ecosystem services and human security	139
4.5.2. Ecosystem services and Basic material for a good life	140
4.5.3. Ecosystem services and human health.....	145
4.5.4. Ecosystem services and Good social relations, freedom of choice and action	151
4.5.5. Discussion and outlook	156
5. Current resource/environmental governance in the Cameroon estuary: Analysis of the major management gaps and shortcomings	160
5.1. Sectoral approach to environmental Governance in Cameroon.....	160
5.2. The case of Mangroves governance and management.....	162
5.3. The case of Fisheries governance and management	165
5.3.1. Fisheries Governance issues	165
5.3.2. Challenges of fisheries management	166
5.4. Discussion and outlook	171
6. Towards a state-of-the-Art Governance and Management of the Cameroon estuary: Introducing ICM and the sustainable livelihood framework.....	173
6.1. Measures to improve fisheries management.....	173
6.2. Integrated Coastal management framework for improved fisheries management and livelihoods.....	175
6.2.1. Rationale for ICM	178
6.2.2. Some salient Characteristics of ICM.....	179
6.2.3. The ICM Framework.....	180
6.2.4. Implementing ICM in the Cameroon estuary.....	181
6.2.5. Proposed Mechanism for the operationalization of ICM in the Cameroon estuary.....	182
6.2.5.1. The ICM System (ICMS).....	182
6.2.5.2. The proposed ICM Governance framework for the Cameroon estuary ..	182
6.2.6. Key Challenges to be encountered in an attempt to implement ICM in Cameroon.....	186
6.3. Discussion and outlook	188
7. General Discussion, Recommendations and Conclusion	190
7.1. General Discussion	190
7.2. Recommendations	192
7.2.1. Specific recommendations to the fisheries sector	192
7.2.2. General recommendations.....	193
7.3. Conclusion.....	199
References.....	202
Annex 1: Educational background and Publications.....	211
Annex 2: Acknowledgements.....	212
Annex 3: Questionnaire	214

List of Abbreviations

CZCSV - Veterinary centres for zootechnical and sanitary control
DAEPIA - Sub-divisional Delegations of Livestock, Fisheries and Animal Industries
DDEPIA - Divisional Delegation of Livestock, Fisheries and Animal Industries
DFID – Department For International Development
DREPIA - Regional Delegation of Livestock, Fisheries and Animal Industries
EEZ – Exclusive Economic Zone
FAO – Food and Agricultural Organization of the U.N
FCFA – Central African Financial Community (Unit of Cameroonian currency – 450 FCFA=USD 1)
FREMP – Fraser River Estuary Management Plan
GCLME – Guinea Current Large Marine Ecosystem
ICM – Integrated Coastal Management
IPCC – Inter-governmental Panel on Climate Change
IPCC-WGI - Inter-governmental Panel on Climate Change – Working Group I
IUCN – International Conservation Union
MINEPIA – Ministry of Livestock, Fisheries and Animal Industries
NERRS - National Estuarine research reserve system
NOAA – National Oceanic and Atmospheric Administration
OECD – Organization of Economic Cooperation and Development
POPs – Persistent Organic Pollutants
S.D – Sustainable Development
S.L – Sustainable Livelihoods
TBT - Tri-butyl – Tin
UNCED – United Nations Conference on Environment and Development
UNFCCC – United Nations Frame work Convention on Climate Change
USCOP – United Nations Commission on Ocean Policy
WCED – World Conference on Environment and Development
WHO – World Health Organization
WSSD – World Summit on Sustainable Development

List of Figures

- Figure 1-1.** Estimated global temperature averages for the past 1000 years, with predictions to 2100 depending on various plausible scenarios for future human behavior.
- Figure 1-2.** Sources, pathways and circulation of excessive nitrogen in a coastal ecosystem
- Figure 1-3.** Performance evaluation of the FREMP
- Figure 1-4.** Physical, Biological and Human Processes in the Estuary
- Figure 1-5.** Location of of the Cameroon Estuary within the EEZ
- Figure 1-6.** The relief and hydrographic network of the Cameroon estuary
- Figure 1-7** Mean monthly rainfall of Douala
- Figure 1-8.** Areas of Mangroves cover in the Cameroon estuary
- Figure 1-9.** The four Administrative Divisions of the Littoral Region of Cameroon showing the Wouri Division and the city of Douala
- Figure 1-10.** Rate of urbanization in Cameroon by Region
- Figure 1-11.** The change in the population density of Douala, 1976, 1987 and 2005
- Figure 1-12.** Distribution of enterprises and establishments with respect to survey regions
- Figure 1-13.** Distribution of workforce and turnover with respect to regions surveyed
- Figure 1-14.** Administrative Subdivisions of Wouri Division
- Figure 3-1.** The protective and regulatory functions of mangroves
- Figure 3-2.** Uses of the Cameroon estuary (1992)
- Figure 3-3.** General uses of the Cameroon coast and areas surrounding the Cameroon estuary (2009)
- Figure 3-4.** Projected growth of the urbanized area of Douala in terms of urban uses (in hectares), 1991-2001
- Figure 3-5.** The Stages of Sustainable Development Model (SSDM)
- Figure 3-6.** The Economic Sustainability Model
- Figure 4-1.** Major fishing zones and fishery resources of the Cameroon coast
- Figure 4-2.** Actors in the different activities by nationality in the Wouri Division – Cameroon estuary, 2009
- Figure 4-3.** Percentage of total fishing population by nationality, 1983
- Figure 4-4.** Percentage of total fishing population by nationality, 2010
- Figure 4-5.** Number of fish sellers in the market by gender and nationality
- Figure 4-6.** Types and number of social amenities in the fishing villages of Douala VI
- Figure 4-7.** Average Monthly income and expenditure of fish sellers
- Figure 4-8.** Amounts paid to Veterinary authorities as sanitary tax
- Figure 4-9.** Average number of dependent children in households of the fishing communities
- Figure 4-10.** Nature of building materials
- Figure 4-11.** Rate of home ownership
- Figure 4-12.** Sanitation (access to toilet facilities)
- Figure 4-13.** Percentage of Population with access to portable water
- Figure 4-14.** The M.A Ecosystem and constituent of wellbeing model
- Figure 4-15.** Minimum flooding levels (2 m): elevation and areas at risk by the year 2050 along the coast of Cameroon
- Figure 4-16.** No. of cholera cases reported and the No. of deaths/*10
- Figure 4-17.** Distribution of jobs with respect to activity sectors and gender
- Figure 4-18.** Distribution of permanent jobs with respect to gender
- Figure 4-19.** Distribution of households according to age and gender of the head of the household in Douala -

2007

Figure 5-1. *The forest management framework of Cameroon which does not make special provisions for mangroves*

Figure 5-2. *Allocated forest Management Units in Cameroon*

Figure 5-3. *Multiple ocean uses affecting the fishery Ecosystem in the Cameroon estuary*

Figure 5-4. *the Sectoral approach to environmental management and impacts on Sustainable Development of the Cameroon Estuary*

Figure 6-1. *The integrated planning and implementing process: the ICM cycle*

Figure 6-2. *The ICM System for the Cameroon Estuary adapted from the PEMSEA ICM system*

Figure 6-3. *Structure of a possible ICM Governance component for the Cameroon estuary*

Figure 6-4. *ICM model incorporated into DFID Sustainable livelihoods framework*

Graph 6-5. *Main impediments to the implementation of ICM*

Graph 7-1. *Fish imports for the main African coastal Countries in 1990 and 1994 (x1000 tons)*

List of Plates

- Plate 1.* Aerial photograph of the Cameroon Estuary showing evergreen mangrove forests
- Plates 2-6.* Mangroves and some of the most common uses in the Cameroon estuary
- Plates 7-9.* Fishery resources in the Cameroon estuary
- Plates 10-15.* Common mining resources in the Cameroon Estuary – sand and gravel
- Plates 16-19.* Heaps of Periwinkle shells extracted from the Cameroon estuary.
- Plates 20-23.* Cultural festival within the Cameroon estuary – the “Ngondo Festival”
- Plate 24.* A partial view of the port industrial zone of Bonaberi – Douala, viewed from the Bonaberi bridge
- Plate 25.* View of the SCDP petroleum and gas depot in the Bepanda neighbourhood, Douala, viewed from the highway
- Plate 26-27.* The abusive disposal of assorted chemical and solid wastes at the Bepanda and in Bonanjo neighbourhoods, Douala, Cameroon
- Plates 28-29.* Domestic waste disposal in wetlands of Bonasama and in Youpwe neighbourhoods of the Cameroon estuary
- Plate 30.* Areal view of some residential quarter in Douala showing the the state of haphazard and unplanned constructions
- Plate 31.* Home construction in reclaimed wetlands in Douala – Bonasama area
- Plates 32-33.* Accelerated erosion in the aquatic environment of Douala
- Plates 34-35.* Invasive species in the Cameroon estuary wetlands, notably water hyacinth
- Plates 36-41.* Mangrove exploitation and commercialization in the Cameroon estuary – Bonasama area
- Plate 42.* Mangrove degradation in the Cameroon estuary
- Plates 42-45.* Sand mining activity in the Cameroon estuary and its impacts
- Plates 46-49.* Different kinds of locally made boats and their uses
- Plate 50.* Boat construction unit for the construction of a planked boat of about 10m long using
- Plate 51.* Wrecked abandoned structure in the middle of the sea Douala port – the Bonaberi District
- Plates 52-55.* Fish markets in Douala for commercialization of artisanal fishery products
- Plates 56-62.* Bottom dwelling fishery species caught in the artisanal fishing grounds in the estuary
- Plates 63-70.* Different fish species landed in Youpwe fishing port by artisanal fishers
- Plates 71-76.* Different socio-professional groups in the Artisanal fishing sector
- Plate 77.* A home in the Douala area constructed with old zinc sheets and mangrove wood, practically located on water, showing poor living and hygienic conditions and non respect of building regulations in the fishing community of Bonasama, Cameroon estuary
- Plates 78-79.* Floods after heavy rains in down town Douala
- Plates 80-83.* State of environmental degradation and poor hygienic conditions in the Youpwe market
- Plates 85-90.* Small sized fish landed in Youpwe fishing port, evidence of over-fishing and stock depletion

List of Tables

- Table 1.** *Classification of estuaries landforms and their description*
- Table 2.** *Sources of industrial pollutants in the Cameroon estuary*
- Table 3.** *Comparism of nutrient loads within the Cameroon estuary from the river to the ocean in the dry and wet seasons*
- Table 4.** *Physical characteristics of the Cameroon estuarine system*
- Table 5.** *The major rivers, their basins into which they drain approximate length, their confluence and the approximate areas of the city drained*
- Table 6.** *The rate of seasonal runoff of the major rivers in the Cameroon estuary*
- Table 7.** *Monthly temperature and rainfall of Douala*
- Table 8.** *Population growth of Douala between 1976 and 2010, as shown in the Table below*
- Table 9.** *Population density of Douala between 1976 and 2005*
- Table 10.** *Partition of workforce in Douala between the Formal and Informal sectors*
- Table 11.** *Subdivisions which makeup Wouri Division and the major quarters*
- Table 12.** *Time schedule of research activities*
- Table 13.** *Agricultural activities in divisions surrounding the Cameroon estuary*
- Table 14.** *Concentrations of POPs¹ found in organisms within the Cameroon estuary*
- Table 15.** *The rate of urbanization and growth of the urbanized area of Douala*
- Table 16.** *The various types of boats constructed and used in the study area.*
- Table 17.** *The geographical locations of the major fishing communities as well has the population of fishermen per fishing camp and their distribution per nationality in Wouri Division, Camerroom estuary*
- Table 18.** *local names of fish species caught in the Cameroon estuary by artisanal fishers*
- Table 19.** *Species of fish caught by all fisheries in the Cameroon estuary*
- Table 20.** *Actors in the different activities of the artisanal fisheries sector by nationality in Wouri Division, Cameroon estuary area, in 2009*
- Table 21.** *Percentage of fishermen in the fishing grounds by nationality of fishermen, 1983 and 2010*
- Table 22.** *Number of fish sellers at the market by gender and by nationality in Youpwe*
- Table 23.** *The distribution of basic social facilities in the fishing camps in Douala VI– Cameroon estuary*
- Table 24.** *Average monthly income expenditure of fish sellers Youpwe and Bonasama localities*
- Table 25.** *Periods of peak and meagre incomes*
- Table 26.** *Total quantities of smoked fish landed and the amount paid as sanitary tax (Bonasama)*
- Table 27.** *Total quantities of smoked fish landed and the amount paid as sanitary tax (Bonasama)*
- Table 28.** *Marital status and average number of children/persons per household of socio-professional groups in Cameroon estuary*
- Table 29.** *Nature of building materials of homes and frequency of floods*
- Table 30.** *Home ownership status*
- Table 31.** *Hygiene and sanitation status*
- Table 32.** *Source of drinking water and health status of population*
- Table 33.** *Cameroon Estuarine Environmental Health and livelihood Assessment based on the Drivers, Pressure, State, Response (DPSR) Model*
-

Table 34. *Statistics of sand extraction, production cost and the annual revenues to the actors*

Table 35.. *The daily wages structure of different mining actors per sand type*

Table 36. *Summary of some major diseases in the Cameroon estuary between 2010 -2011*

Table 37. *Cholera cases and deaths in Douala notified to WHO between 1996 and 2005*

Table 38. *Summary of major environmental-related sectoral organizations which have a direct or indirect impact on Fisheries, their jurisdictions, Mandates, and key regulations*

Table 39. *Rice importation in Cameroon (2007 and 2008)*

Table 40. *Fish importation in Cameroon (2007 and 2008)*

Table 41. *The total trade situation of Cameroon (2005-2009)*

Abstract

The economy of Cameroon as well as most other developing countries is still entirely natural resource-based, necessitating huge population concentrations, especially of youthful age groups, in areas endowed with such natural resources, especially coastal and marine ecosystems. Estuarine areas for example are centres of great socio-economic prospects for current and future generations. This study was conducted in the Cameroon estuary which comprises a variety of forms including; lagoons, mangrove swamps, creeks, mud flats, sand bars and marshes. The system therefore presents favourable ecological conditions for the evolution of a very productive system in terms of abundant fish stocks, prawns, shrimps and other valuable aquatic resources such as mangroves, mainly due to the deposition of nutrients from the numerous rivers emptying into it. Such natural endowments have made the estuary an area of immense socio-economic, cultural and political significance to the local communities inhabiting it and to the Cameroonian nation as a whole. Politically, the estuary accommodates the City of Douala, and serves as a major gateway into Cameroon. As a result, it hosts the biggest and main international commercial seaport of the country, located on River Wouri, 20 km from the sea, prompting Douala to claim the status of economic capital of Cameroon. Socio-economically, Douala contains about 95% of all the major industrial and commercial activities, with the Douala seaport handling 95% of all freight moving into or out of the country; as well as the largest urban population of the country, about 3 million people. The study however reveals that fishing (artisanal) is indisputably the most important socio-economic sector, impacting directly and indirectly on the lives of the large portions of the populations involved in the long chain of activities linked to it and/or consuming the wide variety of products ensuing from it. Fish represent the principal source of protein for the populations of the littoral region (50%), particularly the poorer segments of the population. In 2000 for example, fish consumption was estimated at 14.3 kg/person/yr, compared with all other sources of animal protein put together (beef, pork, chicken) estimated at 13.8 kg/person/yr. The fisheries sector is also an important source of employment and revenue to fishers and other socio-professional groups involved in production, harvesting and landing site-based activities, and who depend on it for their entire livelihoods, together with their dependents, in some of the estuary's most populated communities, such as Youpwe, Bonaberi and the 47 fishing villages that constitute Douala VI subdivision. At the national level fisheries and

coastal resources account for the most important source of non oil export revenues and highly demanded by land-locked Central African states such as Chad and Central African Republic. The study further reveals that despite the enormous importance and potentials of the Cameroon estuary and the fisheries sector therein, the ecosystem is under intense pressure, representing serious and complex challenges to sustainable development. The pressures emanate from the numerous conflicting terrestrial and aquatic estuarine uses, including; uncontrolled, poorly executed wetland reclamation projects and unregulated resource exploitation (fishing and mangroves, etc.); indiscriminate residential waste disposal; industrial and agricultural pollution; etc., resulting in qualitative and quantitative depletion of the very resource-base on which the human populations inhabiting the estuary depend, and seriously impeding the economic growth of the area. Impacts of pollution and degradation of the Cameroon estuarine environment based on a study by IUCN in 1991 are frightening, and include:

- Decrease in fish population (about 15%/year) either due to direct mortality, migration or over-fishing;
- 2.6% annual decrease in area covered by mangroves;
- High contents of Tri-butyl – Tin (TBT), an anti-algae paint used in shipyards found in the flesh of molluscs and reduction in the harvest of crustaceans.

This study therefore explores the root causes of the sustainable development challenges experienced in the Cameroon estuary, with emphasis on the fisheries sector, and in particular, the livelihood aspects of the estuary's poor fishing communities who live in the rural areas, and in the low-lying often inundated parts of the estuarine urban landscape, characterized by indiscriminate waste disposal, and who face very high costs of living and weak financial status, suffer from poor health, lack access to fishing grounds dominated by foreigners, and have limited access or are completely lacking in basic social amenities such as schools, health centres, markets and hygiene and sanitation facilities.

The root causes of environmental and resource degradation have been found to be the poor, centralized, sectoral and top – bottom approach to management that characterizes all sectors of the economic and social life of Cameroon. This is coupled with a fuzzy application of the decentralization process, the lack-luster attitude and limited expertise of resource and environmental management officials.

Based on the research findings, an integrated management model for sustainable utilization and development of the Cameroon estuary has been proposed. The Integrated Coastal management framework has been developed for the sustainable management of fisheries in particular, and the entire

estuarine ecosystem in general. In order to make the improvement of community livelihoods the focus of such a development model, the ICM framework has been incorporated into the DFID Framework for Sustainable Livelihoods. This has the potential to ensure the sustainable development of the Cameroon estuary and enhance the achievement of the MDGs as prescribed by different international Conferences and conventions, especially; UNCLOS of 1982, WCED of 1987, Agenda 21 of the UNCED, 1992, and the WSSD, 2002.

Key words: sustainable development; sustainable livelihoods; challenges; Cameroon estuarine complex; fisheries; Integrated Coastal Management.

摘要

海岸带地区，通常被视为世界上拥有巨大财富和具有社会经济发展前景的地区。众多较具生产力的农业种植活动及其他以传统资源为基础的活动如沿海渔业、养殖业、林业等都位于河流三角洲和沿海平原地区。周边还存在如工业，航运，旅游和采矿等活动。像其他许多发展中国家一样，喀麦隆的经济仍然处于完全依赖自然资源以及庞大的人口劳动力密度资源特别是年轻人。但这些国家和地区都拥有了许多自然资源，特别是海岸带和海洋生态系统。而海岸带地区一般都是当代和后代的社会经济发展前景很好的中心地区。

本论文重点调查研究了喀麦隆河口地区复杂的生态系统，包括泄湖、红树林、溪流、泥流、沙坝、沼泽地带等生态系统的现状，特别是渔业方面。并提出了生态系统正面临着巨大压力、以及可持续发展面对的严重和复杂的挑战。论文还探讨了造成喀麦隆河口地区的可持续发展挑战的根本原因，强调了渔业方面。基于这些研究成果，论文提出了喀麦隆河口持续利用和发展的综合管理模式。

喀麦隆河口地区现状表现如下：一、资源现状：基于众多河流汇入的营养物质，生态系统显示出有利的生态环境和高生产力系统：丰富的鱼类、虾、蟹和其他如红树林等有价值的水生资源。而喀麦隆大体海岸线的状况正与这相反，上升流作用的减弱导致了生物大量减产。二、研究区 Douala 市的情况：1、政治方面，Douala 市作为喀麦隆的河口城市，它是进入喀麦隆的主要通道。并因此拥有位于 Wouri 河上全国最大的、最主要的国际贸易海港。该海港距海 20 公里，促使 Douala 占据着喀麦隆经济首都的地位。2、社会经济方面，Douala 占据了 95% 的全国主要工业和商业活动，其中 Douala 海港承载了 95% 的货物进出口，并拥有着全国最多的城镇人口 300 万。三、渔业方面的现状：作为无可争议的最重要的社会经济部分，渔业直接或间接影响着大多数人口的生活，包括参与的有关的一系列的活动或者消费的各种产品活动。鱼类是沿岸地区（50%），特别是贫困人口的人群中蛋白质的主要来源。渔业还是就业、渔民收入和其他社会职业团体的重要来源之一。包括生产、收获和以陆地为基础的活动，以及在一些人口的多河口地区那些依靠其养生的家庭，比如 Douala 地区的 Youpwe，Bonaberi 和 47 个渔村。国家一级渔业和沿海资源是非石油

Degree papers are in the "[Xiamen University Electronic Theses and Dissertations Database](#)". Full texts are available in the following ways:

1. If your library is a CALIS member libraries, please log on <http://etd.calis.edu.cn/> and submit requests online, or consult the interlibrary loan department in your library.
2. For users of non-CALIS member libraries, please mail to etd@xmu.edu.cn for delivery details.

厦门大学博硕士论文摘要库